Notice of Allowability	Application No.	Applicant(s)	
	10/743,736	SATO ET AL.	
	Examiner	Art Unit	
	Tom V. Sheng	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *amendment filed on 4/6/2007*.

2. ☒ The allowed claim(s) is/are *1-8*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Double Patenting

1. An update inventor search is done and a later-filed and independent application (10/998002) is found to form a basis for a provisional nonstatutory obviousness-type double patenting rejection on the current application. On the other hand, since the current application is otherwise allowable and is an earlier-filed application, a provisional nonstatutory obviousness-type double patenting rejection would not be necessary at this point (See MPEP section 804, page 17, under "Nonstatutory Double Patenting Rejections"). However, there will be a double patenting rejection on application 10/998002 and a terminal disclaimer is required to overcome the rejection.

Allowable Subject Matter

2. Claims 1-8 are allowed.

3. The following is an examiner's statement of reasons for allowance:

The invention is directed to a display device capable of performing gamma correction of a video signal voltage applied to respective pixels. The display device includes a video signal lines drive circuit, which comprises a storage circuit that stores display data, a reference data generating circuit that generates reference data, a ramp voltage generating circuit that generates at least one ramp voltage, multiple comparing circuits that compares the stored display data with the reference data, and multiple sampling circuits that sample the ramp voltage based on results from the comparing circuits and output the sampled voltages to respective video signal lines, wherein the

reference data generated by the reference data generating circuit is changed non-linearly with respect to time.

Independent claims 1 and 2 identify, inter alia, the uniquely distinct features,

"wherein the reference data generating circuit includes:

a selection circuit to which a plurality of clocks which have different frequencies from each other are inputted and selects one clock out of the plurality of clocks in response to a selection control signal;

a counter which counts the clock selected by the selection circuit and outputs the number of counts as the reference data; and

a control part which transmits the selection control signal which indicates the clock to be selected by the selection circuit in response to a preset number of counts and the number of counts of the counter."

Independent claim 3 identifies, inter alia, the uniquely distinct features,

"a sampling circuit to which a comparing result of the two neighboring comparing circuits is inputted and outputs video signal voltages of polities which are opposite to each other to the neighboring video signal lines, wherein the sampling circuit includes

i) a first sampling circuit which samples the ramp voltage of positive polarity generated by the ramp voltage generating circuit in response to an inputted result of comparison of one comparing circuit out of two comparing circuits,

ii) a second sampling circuit which samples the ramp voltage of negative polarity generated by the ramp voltage generating circuit in response to an inputted result of comparison of another comparing circuit out of two comparing circuits,

iii) a first switching circuit which inputs the inputted result of comparison of one of comparing circuit out of two comparing circuits to either the first sampling circuit or the second sampling circuit and the inputted result of comparison of another comparing circuit out of two comparing circuits into either the second sampling circuit or the first sampling circuit in response to an alternating signal inputted from the outside in response to an alternating signal outputted from the outside, and

iv) a second switching circuit which outputs the ramp voltage of positive polarity sampled by the first sampling circuit to one video signal line or another video signal line out of neighboring video signal lines as a video signal voltage, or outputs the ramp voltage of negative polarity which is sampled by the second sampling circuit to another video signal line or one video signal line out of the neighboring video signal lines as a video signal voltage in synchronism with the changeover at the first switching circuit in response to the alternating signal."

Janssen et al. (US 6,429,858), hereinafter Janssen, teaches a liquid crystal display including a column driving circuit. The driving circuit comprises column/pixel registers storing display data, a counter counting a clock, a ramp generator with an increasing or decreasing ramp signal depending on the count output from the counter, comparators each comparing the counter output with a number stored in a corresponding pixel register, and track-and-hold circuits each storing a voltage equal to the instantaneous output of the ramp generator based on a pulse from a corresponding comparator. Janssen does not teach the claimed elements of the reference data generating circuit and the claimed elements of the sampling circuit.

Naiki (US 6,956,549) teaches a LCD driver compares an image signal with a count of a counter repeatedly counting a clock. Based on the result of the comparison, the LCD driver outputs pulses each having a duty factor in accord with the image signal. When the count is not between first and second predetermined numbers, the frequency of the clock supplied to the counter is switched from a fundamental frequency to a low-frequency, thereby controlling the width of a drive voltage of a liquid crystal display cell and correcting the image signal in association with the S-shape characteristic of optical transmittance of the liquid crystal display cell. Even though the principle of operation is similar to the current application, the setup does not involve sampling of the ramp voltage in any of the independent claims, and further does not teach comparing with a preset number of counts in claims 1 and 2 nor the sampling circuit in claim 3.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom V. Sheng whose telephone number is (571) 272-7684. The examiner can normally be reached on 9:00am - 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tom Sheng

AMR A. AWAD
SUPERVISORY PATENT EXAMINER